Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

NEW CYCADS AND CONIFERS FROM THE TRIAS OF PENNSYLVANIA.

BY AMOS P. BROWN.

The Museum of The Academy of Natural Sciences of Philadelphia has recently received a number of plant fossils from the Trias of Pennsylvania, the gift of Mr. George Velder, of Bucks County. They come from a small local quarry, worked from time to time to supply stone for road metal. The quarry is located in the Norristown Shales of Lyman,[1] the lowermost member of his "New Red," with which is to be correlated the Stockton of Kummel.[2] The stone in which the impressions are found is a thin-bedded, dark, shaly sandstone, with numerous small mica flakes, and sufficiently fine-grained to take a good impression of the plants. These are in such good condition that they were evidently imbedded in the mud when fresh; the flexuous character of some of the species is perfectly reproduced, indicating that the mud in which the impressions were made was very soft. In some of these impressions a coaly deposit has replaced the cellulose; in others the impression shows a rusty deposit, indicating that a certain amount of pyrites was reduced by the vegetable matter after the plant was imbedded, which has become oxidized to limonite, as the rock has been brought to the surface again by erosion. On the specimens thus far studied, two species of Cycadales and four Coniferæ are represented, of which four are new to science, two Cycadaceæ and two Pinaceæ.

Class CYCADALES.

Family CYCADACEA.

Podozamites formosus sp. nov. Plate I.

Rachis rather stout, varying in diameter from 5 mm. to 2.5 mm. in a length of 450 mm., marked near the edges of the upper side by the scars of attachment of the leaflets, of which there are 35 on each side in this distance of 450 mm. Leaflets rather distantly spaced on the rachis, extending about at right angles to it, and the basal leaflets somewhat reflexed; alternate to sub-opposite, nearly sessile; attached at intervals of 11 to 13 mm. by the contracted base. Form of leaflets linear, parallel-sided, with the margin thickened and reflexed and the apex obtuse and rounded, rather suddenly contracted at the base where they are attached to the rachis. The length of the leaflets is about 90 mm., width 10 to 11 mm. They are deciduous, leaving an elongated scar measuring 3 mm. longitudinally by 1 mm. transversely on the rachis when they fall; the middle of the scar is marked by a circular spot where the vessels emerge. Fragments of the bare rachis occur marked with the leaf scars and the individual detached leaflets are found on some slabs. The leaflets are strongly parallel nerved, the nerves radiating from the point of attachment to the rachis and branching dichotomously until beyond the contracted base of the leaflet, from which point they are simple and paralled to the end. Those leaflets towards the basal end of the rachis are variously split at the ends along the veins, or the ends of the leaflets are variously divided into two or three lobes with rounded ends and parallel margins, probably due to erosion or perhaps to cutting by insects. The leaflets must have been rather thick, for they leave behind a distinct coaly film, and in some cases the rachis impression shows a still heavier film of coal. Owing to the linear form of the leaflet and the obtuse apex, there seems to be no contraction of the nerves at this point.

---

[1] Summary Final Report, *Geol. Surv. Pa.*, III, Part 2, 1895.

[2] *Ann. Rep. State Geol. Surv. New Jersey*, 1896.

Zamites velderi sp. nov. Plate II.

Rachis slender, about 1.5 mm. in diameter, having about 30 leaflets on each side in a length of 150 mm. Leaflets alternate to sub-opposite, sessile; nearly touching at their bases; inserted on the upper side of the rachis by the contracted base, which expands abruptly from the point of attachment to somewhat more than the normal average width of the leaflet, making the base slightly eared; the leaflets point outward and forward from the rachis at an angle of 65°. Form of the leaflets linear, parallel margined above the expanded base, and rounded and obtuse at the apex; length 40 to 50 mm., becoming shorter towards the base of the rachis; width 3.5 to 4.5 mm.; the edges of the leaflet reflexed and thickened. The leaflets are parallel-nerved, the nerves radiating from the point of attachment to the rachis, but their mode of forking is not well preserved and does not appear to be dichotomous; nerves fine, about six in 1 mm.

The attachment of the leaflets is at the upper side of the rachis, by a sharply contracted base, and the expanded, eared bases overlap the rachis somewhat, as well as being in contact with each other, but there is no evidence on the one specimen of this species that the leaflets are deciduous, nor were detached leaflets of this species observed on other slabs. The specimen shows the upper part of a leaf, near the apex, but 20 to 30 mm. of this end is broken off. The leaflets become shorter near the apex, one of the last preserved on the specimen, and very near the apex, is 28 mm. long.

Class CONIFERALES.

Family PINACEÆ

Palissya diffusa (Emmons). Plate III.

This species is represented by several slabs showing parts of branches, one with a length of stem of 200 mm. showing the two sides of the branch on two slabs. The branches on this stem are 6 to 7 on a side in a length of 200 mm.; they attain a length of 130 mm. and the ultimate branchlets extend about 20 mm. on each side of the branches. Some coaly matter along the main stem indicates from its thickness a considerable density for the woody stem. The leaves are crowded on the branches, linear oblong, obtuse at the apex and about 1 by 3 mm. They point forward at an angle of 45° and the branchlets are about 4 mm. wide. One of the smaller specimens is figured in Plate III.

Palissya obtusa sp. nov. Plate IV.

Small branches varying in thickness from 4.5 to 2 mm. in different specimens; ultimate branchlets simple, very slender, terminations flexuous, branchlets up to 100 mm. long, alternately attached to the small branch. Leaves spreading laterally, apparently two-ranked, rather widely spaced; about 30 on a side in a distance of 80 mm.; they are inserted subalternately, nearly oppositely, on the ultimate branchlets, attached by a short petiole, nearly sessile. The form of the leaf is linear, sharply contracted at the base and obtuse at the apex, which latter character distinguishes this species from *P. sphenolepis* (Fr. Braun). Their size is 7 mm. in length by 1.5 mm. in width, the midrib is generally distinct. The ultimate branchlets are deciduous, at least in part, as is the case with our living *Taxodium distichum* (L.) which this species recalls.

This species appears upon a number of slabs, all representing terminal or lateral twigs of a branch; those showing definitely a termination are very flexuous and fernlike. The largest specimen shows parts of a branch 300 mm. long and the spreading branches from the main stem are 300 mm. across; parts of adjacent branches cover the slab as though a limb of considerable size had been imbedded at one time. Upon one of these twigs the side branchlets are simple in that portion towards the trunk of the tree, about 70 to 100 mm. long; these are succeeded towards the apex by compound branchlets 150 to 200 mm. long, the little ultimate branchlets upon which are 20 to 30 mm. long. The entire branch evidently expands from the base and tapers again towards the apex recalling the frond of a fern, as is the case with our "cedar" or arbor vitæ of the Pacific coast, *Thuya plicata* D. Don.

Cheirolepis muensteri (Schenk).

This species is represented by some small portions of branches on two of the slabs. While the preservation is very perfect and the characters well shown, the surfaces of the specimens exposed are small in each case. The best one shows a portion of a branch with 8 complete ultimate branchlets on one side and fragments of the ultimate branchlets on the opposite side. These ultimate branchlets are 18–20 mm. long, very thin and flexuous, and tapering from a little over 2 mm. to a point. They are densely leafy, the scale-like leaves being about 2 mm. long and pointing forward at a sharp angle, closely crowded and decurrent at the base. The tip of the leaf is acuminate, pointing forward as a spine; the midrib is pronounced. The best specimen is on a slab with *Palissya obtusa*. The tapering of the ultimate branchlets is due to the leaves' becoming smaller and more closely appressed to the axis of the branchlet towards the tip.

Cheirolepis latus sp. nov. Plate V.

This species is represented on two slabs, one specimen showing the terminal part of a branch. On this specimen the branchlets near the trunk end are 80 mm. long and 25 mm. wide; ovate lanceolate in outline and they stand at 90° from the stem; towards the terminal part they stand at an angle of 80° and they are 60 mm. long, tapering from 15 mm. wide at the base to a point, at the apex of the branchlets, making them linear lanceolate in outline. The branchlets are nearly opposite upon the stem, or sometimes more nearly alternate; they are deciduous, leaving a scar projecting where they fall. The main stem is marked by strong, acutely pointed scales or leaves, covering these points of attachment of the branchlets; these scales often become reflexed after the branchlets fall and produce the appearance of hooks pointing backward on the stem. The ultimate branchlets are two ranked upon the larger branchlets from the stem above described; they are arranged sub-alternately to nearly oppositely, but they are never truly opposite; they are covered with densely crowded leaves which are spirally arranged in four ranks, closely appressed and scale-like, apparently decurrent at the base.

Explanation of Plates I–V.

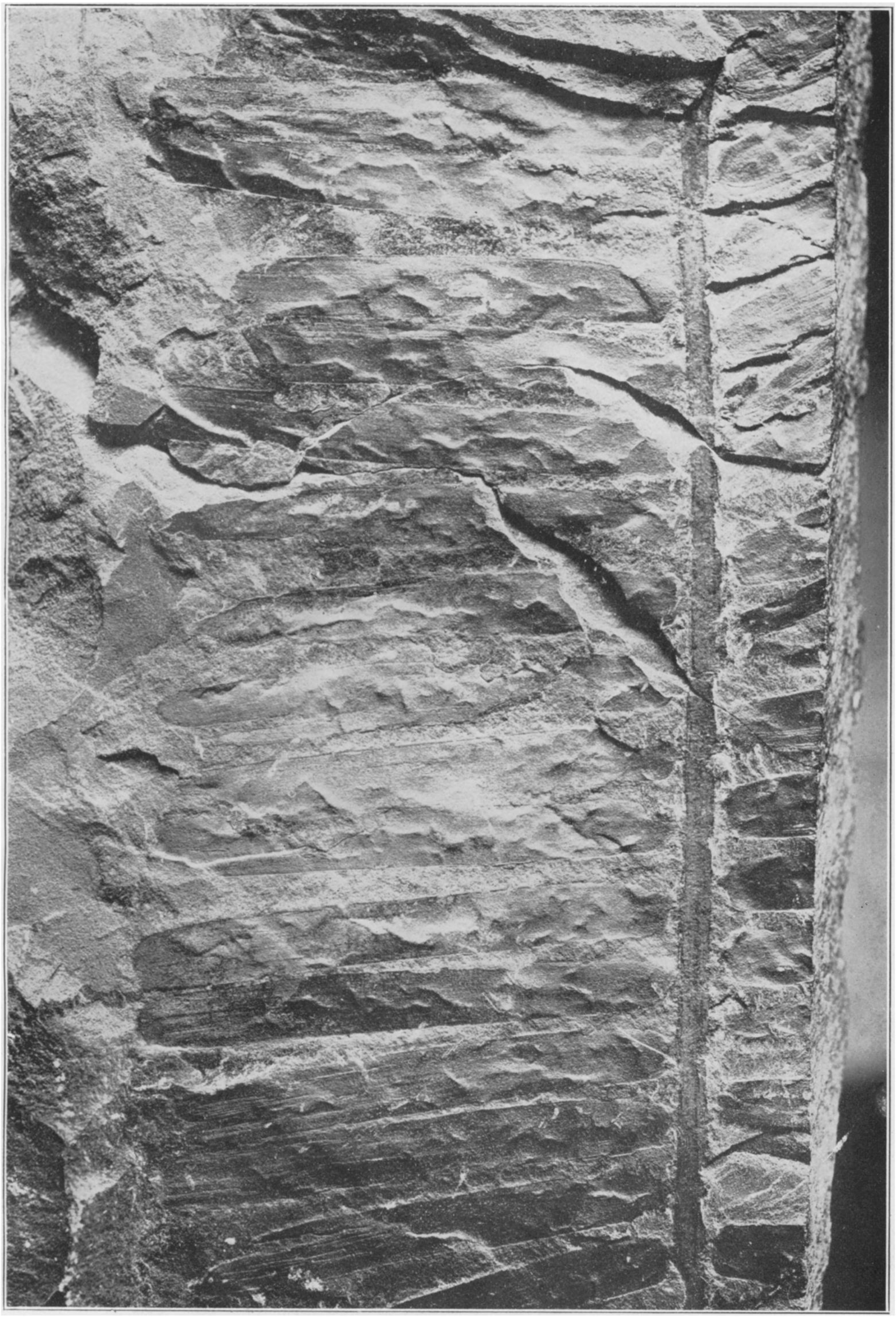
Plate I.—Portion of leaf of *Podozamites formosus* sp. nov. Natural size.

Plate II.—Leaf of *Zamites velderi* sp. nov. Natural size.

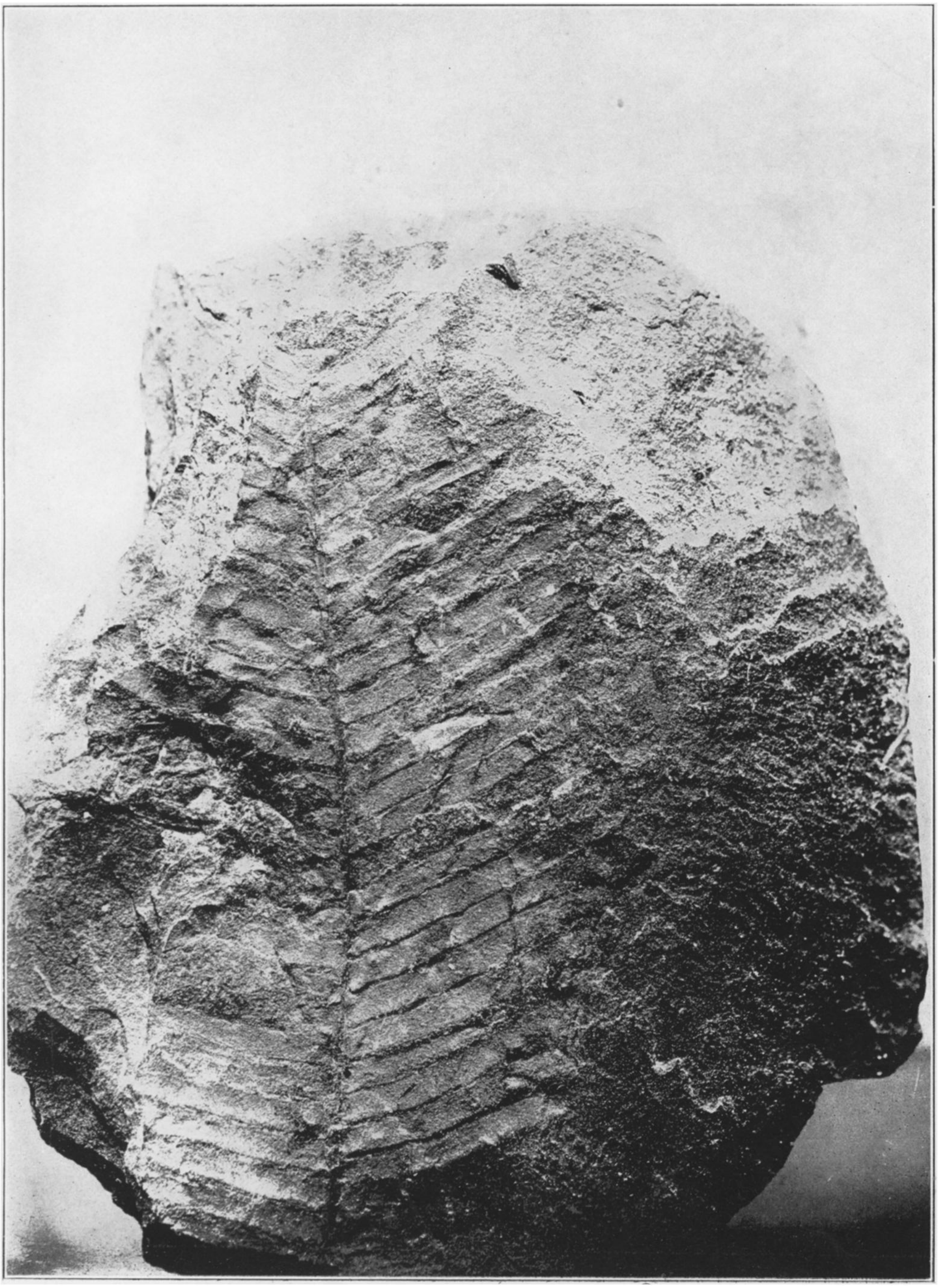
Plate III.—Portion of small branch of *Palissya diffusa* (Emmons). Natural size.

Plate IV.—Small branches, bearing ultimate branchlets, of *Palissya obtusa* sp. nov. Natural size.

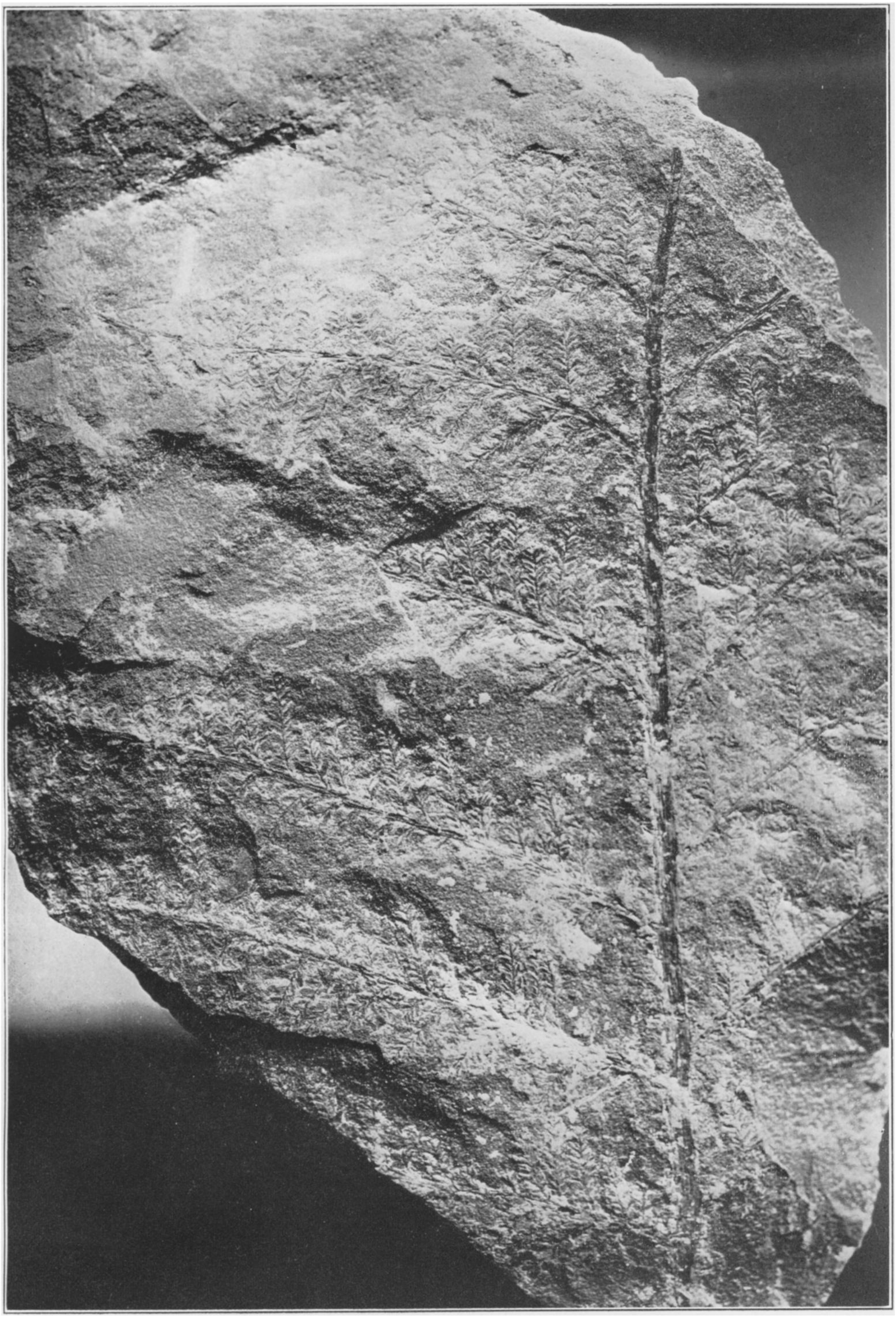
Plate V.—Branch of *Cheirolepis latus* sp. nov., showing the varying shape of branchlets and the scars left by the fall of former branchlets. Natural size.



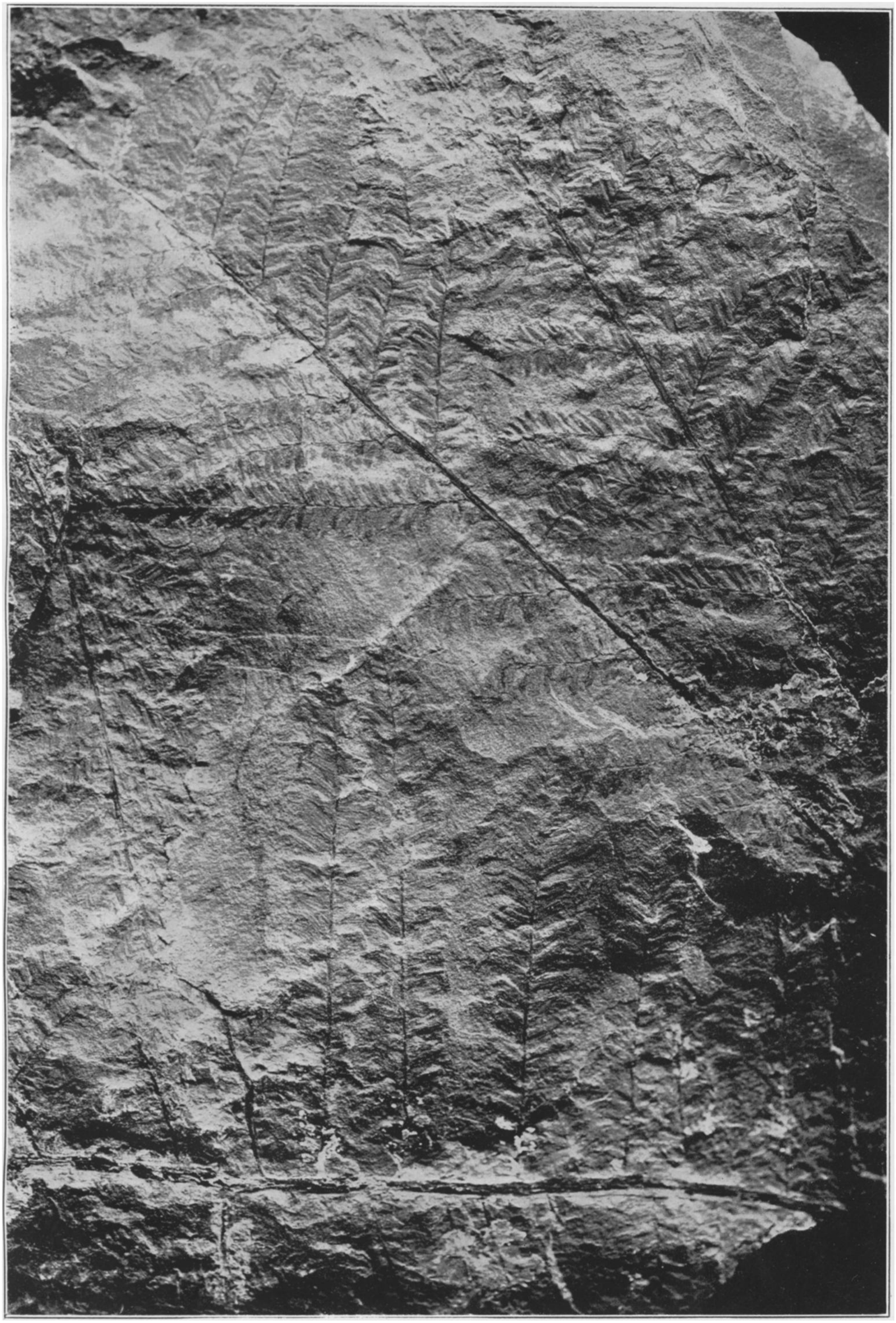
BROWN: NEW CYCADS AND CONIFERS.



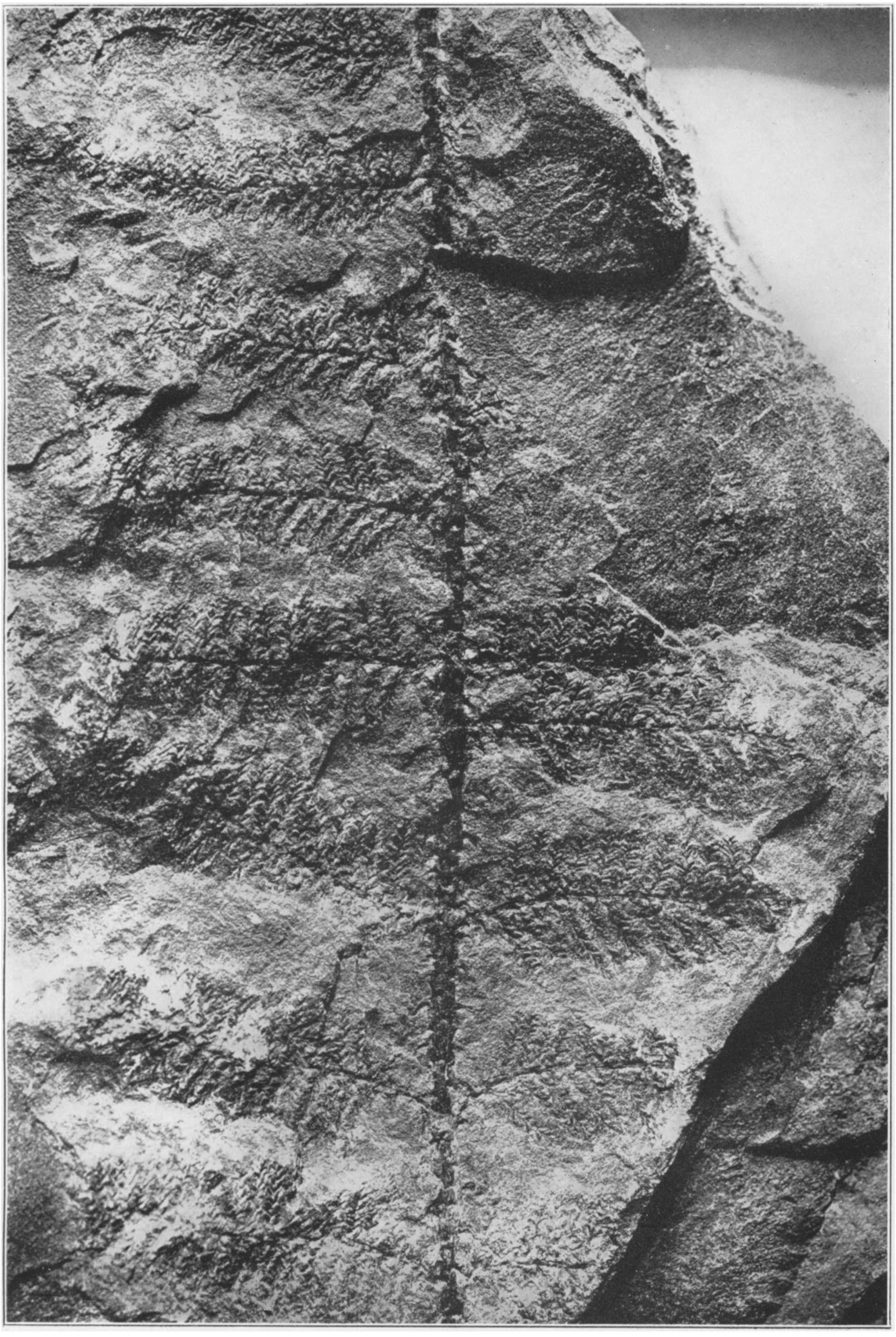
BROWN: NEW CYCADS AND CONIFERS.



BROWN: NEW CYCADS AND CONIFERS.



BROWN: NEW CYCADS AND CONIFERS.



BROWN: NEW CYCADS AND CONIFERS.